IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYLINE SOFTWARE SYSTEMS, INC.,

Plaintiff,

v.

KEYHOLE, INC., and
GOOGLE INC.

Defendants.

CIVIL ACTION NO. 06-10980 DPW

SEPARATE STATEMENT OF UNDISPUTED MATERIAL FACTS IN SUPPORT OF DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT OF NONINFRINGEMENT AND ANTICIPATION

[PUBLIC REDACTED VERSION]

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A. Undisputed Material Facts in Support of Summary Judgment of Noninfringement

Pursuant to Civil L.R. 56.1, Defendants Keyhole, Inc. and Google Inc. submit the following Statement of Undisputed Material Facts in support of their Motion for Summary Judgment of Noninfringement.

Google Earth Fusion, Google Earth Server, and the Geo Coder Server Do Not Infringe Any of the Asserted Claims of the '189 Patent	
1. Skyline asserts that claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3); January 16, 2007 email (Chang Decl., Ex. 28).
2. Each of the asserted claims discloses a method or apparatus for "providing data blocks describing three-dimensional terrain to a renderer."	'189 patent, *e.g.*, claim 1 at col. 16:28-29, claim 3 at col. 16:51-52, claim 7 at col. 17:42-43, claim 12 at col. 18:12-13, claim 14 at col. 18:52-53, claim 18 at col. 20:4-5.
3. Among the products Skyline accuses of infringement are Keyhole 2 Fusion LT, Keyhole 2 Server, Google Earth Fusion, Google Earth Server, and the Geo Coder Server.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3).
4. Skyline's expert has not and cannot articulate the bases for his infringement opinion regarding Google Earth Fusion, Google Earth Server, and the Geo Coder Server.	Rough Deposition of Dinesh Manocha ("Manocha Depo") at 88:3-90:20; 95:21-98:21 (Chang Decl., Ex. 15); July 10, 2006 Expert Report of Dinesh Manocha, Ph.D., *e.g.*, at ¶ 15 (Chang Decl., Ex. 7); December 8, 2006 Expert Report of Dinesh Manocha, Ph.D., *e.g.*, at 2 (Chang Decl., Ex. 9).
5. Skyline's expert did not recognize the Geo Coder Server as an accused product.	July 10, 2006 Expert Report of Dinesh Manocha, Ph.D., *e.g.*, at ¶ 15 (Chang Decl., Ex. 7); December 8, 2006 Expert Report of Dinesh Manocha, Ph.D., *e.g.*, at 2 (Chang Decl., Ex.

[redacted]	
	9).
6. Google Earth Fusion is a software product that processes raw data, configuring data sets and creating databases of geographically referenced information and data.	Deposition of Mark Aubin ("Aubin Depo") at 84:9-21; 85:18-21; 88:12-24; 160:14-17; 200:16-201:14 (Chang Decl., Ex. 11); Deposition of Brian McClendon ("McClendon Depo") at 96:15-97:5; 98:18-23; 233:5-234:1; 272:8-25 (stating [redacted]); 280:17-281:1 (Chang Decl., Ex. 16); Deposition of Edward Ruben ("Ruben Depo") at 120:1-9 (Chang Decl., Ex. 18).
7. Skyline's own expert recognizes that Google Earth Fusion is the product used for database preparation.	July 10, 2006 Expert Report of Dinesh Manocha, Ph.D. at ¶ 43 (Chang Decl., Ex. 7).
8. Google Earth Server is a product that communicates with the Google Earth client software and delivers the contents of a remote database to the client computer.	McClendon Depo at 272:15-25 (Chang Decl., Ex. 16); Deposition of Michael T. Jones ("Jones Depo") at 85:2-87:13 (Chang Decl., Ex. 12).
9. The Geo Coder Server receives search requests from the Google Earth client software and conducts searches based on an address, city name, street name, or other user input, [redacted].	McClendon Depo at 163:16-164:22; 168:21-170:18 (Chang Decl., Ex. 16); Ruben Depo at 14:9-15; 20:18-21:3; 32:12-25; 69:3-70:4; 70:21-71:13 (Chang Decl., Ex. 18).
The Google Earth Client Software ("Google Earth") Does Not Infringe Any of the Asserted Claims of the '189 Patent	
Google Earth Does Not Perform the Step of "*downloading from a remote server one or more additional data blocks … if the provided block from the local memory is not at the indicated resolution level*"	
10. Skyline asserts that claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3); January 16, 2007 email (Chang Decl., Ex. 28).
11. Each of the asserted claims of the '189 patent requires "downloading from a remote server	'189 patent, *e.g.*, claims 1 at col. 16:38-44, claim 3 at col. 16:62-66, claim 7 at col. 17:53-

[redacted]	
one or more additional data blocks … if the provided block from the local memory is not at the indicated resolution level.”	57, claim 12 at col. 18:26-30, claim 14 at col. 18:66-19:3, and claim 18 at col. 20:19-21.
12. The Court construed “downloading … if the provided block from the local memory is not at the indicated resolution level” to mean “downloading … upon some determination that block provided from the local memory is not at the indicated level.”	November 16, 2006 Claim Construction Order at 10-12 (Chang Decl., Ex. 5).
13. The Court recognized that there must be “some determination as to whether the conditional is satisfied before actions predicated on it are taken.”	November 16, 2006 Claim Construction Order at 11 (Chang Decl., Ex. 5).
14. Skyline contends that the [redacted]	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 14 (Chang Decl., Ex. 9).
15. The only function identified by Skyline that [redacted].	Feiner Decl. ¶ 18.
16. The [redacted]. [redacted].	Feiner Decl. ¶¶ 17, 19; [redacted].
17. [redacted].	Feiner Decl. ¶ 20; [redacted]
18. Skyline’s expert admits that [redacted].	Manocha Depo at 259:1-261:2, 262:10-13 (Chang Decl., Ex. 15).
19. During prosecution of the ’189 patent, the	’189 Patent File History, October 4, 2001

[redacted]		
	applicants emphasized the "downloading … if" limitation in distinguishing the prior art.	Amendment at 3 (Chang Decl., Ex. 2 at GOOG 00118).
Google Earth Does Not Perform the Step of "*receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level*"		
20.	Skyline asserts that claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3); January 16, 2007 email (Chang Decl., Ex. 28).
21.	Each of the asserted claims of the '189 patent requires "receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level."	'189 patent, *e.g.*, claim 1 at col. 16:32-34, claim 3 at col. 16:55-57, claim 7 at col. 17:46-48, claim 12 at col. 18:21-23, claim 14 at col. 18:61-63, claim 18 at col. 20:14-16.
22.	The Court construed "renderer" to mean "software and/or hardware object that performs at least the following functions: (1) determining and providing to another object the required coordinates in the terrain along with a respective resolution level; (2) receiving the data blocks corresponding to the specified coordinates; and (3) using the received data blocks to display a three-dimensional image."	March 24, 2006 Claim Construction Order at 26-32 (Chang Decl., Ex. 4).
23.	The Court construed "receiving from the renderer" to mean "something distinct from the renderer receiving from the renderer."	November 16, 2006 Claim Construction Order at 8-10 (Chang Decl., Ex. 5).
24.	Skyline contends that the "renderer" limitation [redacted].	July 10, 2006 Expert Report of Dinesh Manocha, Ph.D. at ¶¶ 60-66 (Chang Decl., Ex. 7); December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 10-11 (Chang Decl., Ex. 9); Chang Decl., Ex. 36 (showing what Skyline's expert contends meets the "renderer" limitation).
25.	The [redacted].	Feiner Decl. ¶ 28.

[redacted]	
26. The [redacted].	Feiner Decl. ¶¶ 28-29.
27. Skyline's expert claims that [redacted]	July 10, 2006 Expert Report of Dinesh Manocha, Ph.D. at ¶ 63 (stating that [redacted]) (Chang Decl., Ex. 7); Manocha Depo at 248:24-250:8; 251:24-252:5 (stating that [redacted]) (Chang Decl., Ex. 15); Chang Decl., Ex. 36 (indicating that Skyline's expert contends [redacted]).
28. Skyline's expert [redacted]."	July 10, 2006 Expert Report of Dinesh Manocha, Ph.D. at ¶ 65 ([redacted]) (Chang Decl., Ex. 7); Chang Decl., Ex. 36 (indicating that Skyline's expert contends [redacted]"). December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 10-11 (identifying "[redacted]") (Chang Decl., Ex. 9); Manocha Depo at 271:9-272:17 (identifying [redacted]) (Chang Decl., Ex. 15).
29. Skyline admits that the "renderer" of the '189 patent does not provide coordinates and a resolution level to itself.	November 1, 2006 Claim Construction Hearing Transcript at 29:23-30:20 (Chang Decl., Ex. 27).
Google Earth Does Not Have "*data blocks belonging to a hierarchical structure*"	
30. Skyline asserts that claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 are infringed by	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No.

[redacted]	
the accused Google Earth products.	1 (Chang Decl., Ex. 3); January 16, 2007 email (Chang Decl., Ex. 28).
31. Each of the asserted claims of the '189 patent requires "data blocks belonging to a hierarchical structure."	'189 patent, *e.g.*, claim 1 at col. 16:29-30, claim 3 at col. 16:52-53, claim 7 at col. 17:43-44, claim 12 at col. 18:13-14, claim 14 at col. 18:53-54, claim 18 at col. 20:5-6.
32. The Court construed "data blocks belonging to a hierarchical structure" to mean "data blocks that are organized into multiple levels of resolution, whereby each level contains data blocks at the same resolution, and each successive levels contains data blocks of a higher resolution than those in the preceding level."	March 24, 2006 Claim Construction Order at 12-15 (Chang Decl., Ex. 4).
33. Google [redacted].	Aubin Depo at 38:4-39:13; 129:15-131:17, 207:24-208:20; 216:11-217:10 (Chang Decl., Ex. 11); Jones Depo at 753:23-755:1 (Chang Decl., Ex. 12); Deposition of Phillip Keslin ("Keslin Depo") at 60:10-63:21 (Chang Decl., Ex. 13); Manocha Depo at 150:18-152:1.
34. [redacted].	Aubin Depo at 38:4-39:13; 129:15-131:17, 207:24-208:20; 216:11-217:10 (Chang Decl., Ex. 11); Jones Depo at 753:23-755:1 (Chang Decl., Ex. 12); Deposition of Phillip Keslin ("Keslin Depo") at 60:10-63:21 (Chang Decl., Ex. 13); Feiner Decl. ¶¶ 32-34.
35. Skyline admits [redacted]	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 8-9 (Chang Decl., Ex. 9); Manocha Depo at 174:2-176:13 (Chang Decl., Ex. 15).
36. [redacted].	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 9 (Chang Decl., Ex. 9);

	Manocha Depo at 154:15-25 (Chang Decl., Ex. 15). Aubin Depo at 205:18-208:5 (Chang Decl., Ex. 11); Jones Depo at 607:17-608:2; 613:9-616:25 (Chang Decl., Ex. 12); Feiner Decl. ¶¶ 33-34.
Google Earth Does Not Have "*data blocks describing three dimensional terrain*" as Skyline Has Interpreted the Limitation	
37. Skyline asserts that claims 1, 3, 7, 8, 9, 12, 14, 18, 19, 22, 23, and 24 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3); January 16, 2007 email (Chang Decl., Ex. 28).
38. Each of the asserted claims of the '189 patent requires "providing data blocks describing three-dimensional terrain to a renderer."	'189 patent, *e.g.*, claim 1 at col. 16:28-29, claim 3 at col. 16:51-52, claim 7 at col. 17:42-43, claim 12 at col. 18:12-13, claim 14 at col. 18:52-53, claim 18 at col. 20:4-5.
39. The Court construed "terrain" to mean "the surface features of an area of land, an object, or a material, including color, elevation, and existing objects or structure on the land, object or material."	March 24, 2006 Claim Construction Order at 17-19 (Chang Decl., Ex. 4).
40. The Court construed "data blocks describing three-dimensional terrain" to mean "a block or collection of data or digital information that represents or describes a section of three-dimensional terrain at a particular resolution level and that includes any additional data overlaid on the digital image of the terrain, such as altitude, labels or optional objects."	March 24, 2006 Claim Construction Order at 9-12 (Chang Decl., Ex. 4).
41. In distinguishing prior art, Skyline claims that downloading only texture data (imagery) or only elevation data does not constitute providing "data blocks describing three-dimensional terrain."	August 11, 2006 Rebuttal Expert Report of Dinesh Manocha, Ph.D. at ¶ 23 (Chang Decl., Ex. 8).

[redacted]	
42. Google Earth [redacted]	Aubin Depo at 214:23-215:10 (Chang Decl., Ex. 11); Jones Depo at 556:18-557:21; 767:23-768:14 (Chang Decl., Ex. 12); Deposition of John Rohlf ("Rohlf Depo") at 178:18-179:16; 180:12-181:20; 189:1-11; 231:16-232:18; 234:2-11 (Chang Decl., Ex. 17); Feiner Decl. ¶ 38.
Google Earth Does Not Infringe Claims 3 and 14 of the '189 Patent	
Google Earth Does Not Perform the Step of "*downloading from a remote server one or more additional blocks … wherein blocks of lower resolution levels are downloaded before blocks of higher resolution levels*"	
43. Skyline asserts that claims 3 and 14 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff's Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3).
44. Claims 3 and 4 of the '189 patent require the download of one or more additional data blocks from a remote server, "wherein blocks of lower resolution levels are downloaded before blocks of higher resolution levels."	'189 patent, claim 3 at col. 16:62-67 and claim 14 at col. 18:66-19:3.
45. The Court construed "downloading" to mean "requesting over a network from a separate computer and receiving on a local computer."	November 16, 2006 Claim Construction Order at 4-8 (Chang Decl., Ex. 5).
46. Google Earth [redacted].	Jones Depo at 642:11-643:8 (Chang Decl., Ex. 12); [redacted]; Feiner Decl. ¶ 41.
47. Skyline's expert [redacted].	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 16 (Chang Decl., Ex. 9) ("[redacted]").
48. Google Earth [redacted]	Jones Depo at 639:15-641:1 (Chang Decl., Ex. 12);

[redacted]		
	[redacted]	Feiner Decl. ¶ 42.
49.	Skyline admits that [redacted].	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 17 (Chang Decl., Ex. 9) [redacted]”).
50.	During prosecution of the ’189 patent, the applicants emphasized that the prior art did not disclose “a downloading order based on resolution levels” or “downloading blocks of lower resolution before those of higher resolution.”	’189 Patent File History, July 5, 2001 Office Action (Chang Decl., Ex. 2 at GOOG 00105) and October. 4, 2001 Amendment (*id.* at GOOG 00118); *see also* November 21, 2001 Office Action (*id.* at GOOG 00131-132) and February 27, 2002 Amendment (*id.* at GOOG 00152).
	Google Earth Does Not Infringe Claims 7, 8, 9, 18, 19, 22, 23, and 24 of the ’189 Patent	
	Google Earth Does Not “*download[] excess blocks not currently needed by the renderer to fill up the local memory when not downloading blocks required by the renderer*”	
51.	Skyline asserts that claims 7, 8, 9, 18, 19, 22, 23, and 24 are infringed by the accused Google Earth products.	September 22, 2006 Plaintiff’s Supplemental Objections and Answers to Interrogatory No. 1 (Chang Decl., Ex. 3).
52.	Claims 7, 8, 9, 18, 19, 22, 23, and 24 of the ’189 patent all require “downloading excess blocks not currently needed by the renderer to fill up the local memory when not downloading blocks required by the renderer.”	’189 patent, *e.g.*, claim 7 at col. 17:58-61 and claim 18 at col. 20:22-24.
53.	The Court construed “when not downloading blocks required by the renderer” to mean “during periods of time when the local computer, or a connection thereof, is not downloading data blocks in response to coordinates received from the renderer.”	November 16, 2006 Claim Construction Order at 17-20 (Chang Decl., Ex. 5).
54.	Skyline contends that the “downloading excess blocks to fill up the local memory when not downloading blocks required by the renderer” limitation [redacted]	December 8, 2005 Expert Report of Dinesh Manocha, Ph.D. at 18-19 (Chang Decl., Ex. 9).

[redacted]	
[redacted]	
55. Skyline argues that "when not downloading blocks required by the renderer" is met because for any single network connection, blocks not needed to display the current view will necessarily occupy the network connection at times different from those in which the blocks required by the renderer are being transmitted.	December 8, 2006 Expert Report of Dinesh Manocha, Ph.D. at 18 (Chang Decl., Ex. 9).
56. The Court recognized that because "the '189 patent allows for a constantly changing user viewpoint, there will often be a queue of data blocks, some of which may not be needed any longer, that have been requested by the renderer, but not yet downloaded. Until these requested blocks have finished downloading, excess blocks will not be downloaded to fill the local memory."	November 16, 2006 Claim Construction Order at 19.
57. [redacted].	Feiner Decl. ¶¶ 47-48.

B. <u>Undisputed Material Facts in Support of Summary Judgment of Anticipation Based on the Public Use of the TerraVision Application</u>

Pursuant to Civil L.R. 56.1, Defendants Keyhole, Inc. and Google Inc. submit the following Statement of Undisputed Material Facts in support of their Motion for Summary Judgment of Anticipation Based on the Public Use of TerraVision.

[redacted]	
TerraVision is Prior Art to the '189 patent	
58. The application for the '189 patent was filed on February 26, 1999.	'189 patent (Chang Decl., Ex. 1).
59. The '189 patent is not entitled to claim the benefit of any earlier application date.	July 28, 2006 Plaintiff Skyline Software Systems, Inc.'s Responses to Defendants' Request for Admission No. 1 (Chang Decl., Ex. 35).
60. TerraVision was in public use before	TerraVision Source Code (Chang Decl., Exs.

February 26, 1998.	20, 34); Deposition of Stephen Lau ("Lau Depo") at 18:18-20:4, 21:25-23:5, 25:12-26:4, 28:1-15, 32:25-40:14, 216:6-217:24, 219:8-224:25 (Chang Decl., Ex. 14); Manocha Depo at 36:8-23 (Chang Decl., Ex. 15); Feiner Decl. ¶¶ 50-51; MAGIC Final Report, *e.g.*, at GOOG 367-370 (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 355 (Chang Decl., Ex. 22); TerraVision Tech Note (Chang Decl., Ex. 23); Clinger, GraphicsNet '95, *e.g.*, at p. 14 (Chang Decl., Ex. 26); **<u>SIGGRAPH '95</u>**: SIGGRAPH '95 Multimedia CD-ROM (Chang Decl., Ex. 25); SIGGRAPH '95 Visual Proceedings, *e.g.*, at GOOG 17691 (Chang Decl., Ex. 30); Feiner Decl. ¶ 50; Lau Depo, *e.g.*, at 82:10-85:4, 86:19-87:2, 90:7-18, 193:22-194:18, 201:5-202:11 (Chang Decl., Ex. 14); **<u>Supercomputing '95</u>**: Supercomputer '95 Brochure (Chang Decl., Ex. 31); Lau Depo at 85:5-86:14, 87:16-20, 90:20-91:4, 108:11-110:10 (Chang Decl., Ex. 14); **<u>1994 MAGIC Symposium</u>**: 1994 MAGIC Technical Symposium, *e.g.*, at GOOG 26967-84 (Chang Decl., Ex. 32); TerraVision Video (Chang Decl., Ex. 24); Lau Depo at 159:11-162:23, 169:1-12 & 175:6-8 (Chang Decl., Ex. 14);

	<u>1995 MAGIC Symposium</u>: 1995 MAGIC Technical Symposium, *e.g.*, at GOOG 21112-28 (Chang Decl., Ex. 33); Lau Depo at 88:15-90:6, 93:20-95:3 & 194:22-198:2 (Chang Decl., Ex. 14);
TerraVision Anticipates the Claims 1, 3, 12 and 14 of the '189 Patent	
61. TerraVision was a software application designed to be run on a computer.	TerraVision Source Code (Chang Decl., Exs. 20, 34); MAGIC Final Report, *e.g.*, at GOOG 362 ("TerraVision was designed to run on certain Silicon Graphics (SGI) workstations….") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 350 ("High frame rates are achieved by using a local very-high-speed rendering engine, an SGI Onyx….") (Chang Decl., Ex. 22).

TerraVision practiced the step of providing "*data blocks describing three-dimensional terrain to a renderer*"	
62. TerraVision rendered three-dimensional terrain.	TerraVision Source Code, *e.g.*, TerraVisionRender and ThreeDWidgetGenerateVisible (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 62-65; MAGIC Final Report, *e.g.*, at GOOG 358 ("The primary objective of SRI's contribution was the design and implementation of an application that allows a user to interact in real time with a synthetic 3D photo-realistic view of a large terrain.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 349, 350 ("TerraVision allows a user to view and navigate through (i.e., 'fly over') a representation of a landscape created from aerial or satellite imagery.") ("TerraVision provides for two-modes of visualization: two-dimensional (2-D) and three-dimensional (3-D)…. In the 3-D mode, the user controls the visualization by means of an input device that allows six degrees of freedom in movement.") (Chang Decl., Ex. 22).
63. In TerraVision, data was stored in equal-sized data blocks called "tiles."	TerraVision Source Code, *see, e.g.*, QuadTile, TsTileId (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 63, 65; Lau Depo at 219:20-220:6 (Chang Decl., Ex. 14); MAGIC Final Report, *e.g.*, at GOOG 359 ("Each level of a Pyramid is divided into small, equal-sized subimages called tiles. These tiles are stored as independently accessible items on the ISS, or as independent files in a local file system.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 349 ("To facilitate processing, distributed storage, and high-speed retrieval over a network, the DEM and images are divided into small fixed-size

	units known as *tiles*.") (Chang Decl., Ex. 22).
64. In TerraVision, image data was stored in equal-sized data blocks called ortho-image tiles or "OI" tiles.	TerraVision Source Code, *e.g.*, QuadTile, TsTileID (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 63, 65; Lau Depo at 219:20-220:6 (Chang Decl., Ex. 14); Manocha Depo at 71:13-72:4 (Chang Decl., Ex. 15); MAGIC Final Report, *e.g.*, at GOOG 359 ("The collection of processed imagery, elevation data, and coordinate information for a given site is called a GeoPyramid tile set.... A Pyramid is a multiresolution representation of a single image, be it an original (digitized) aerial image, a processed satellite image, or an image representing elevation data (also called a Digital Elevation Model, or DEM).") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at 349 ("In order to render an image, TerraVision requires a digital description of the shape and appearance of the terrain. The shape of the terrain is represented by a two-dimensional grid of elevation values known as a *digital elevation model* (DEM). The appearance of the terrain is represented by a set of aerial images known as *orthographic projection images* (ortho-images), that have been specially processed (i.e., ortho-rectified) to eliminate the effects of perspective distortion, and are in precise alignment with the DEM. To facilitate processing, distributed storage, and high-speed retrieval over a network, the DEM and images are divided into small fixed-size units known as *tiles*.") (Chang Decl., Ex. 22).
65. In TerraVision, elevation data was stored in equal-sized data blocks called digital elevation model tiles or "DEM" tiles.	*See* Undisputed Facts ¶ 64; Manocha Depo at 59:13-16 (Chang Decl., Ex. 15).

66. In TerraVision, an OI tile included data representing the appearance of the terrain.	*See* Undisputed Facts ¶ 64.
67. In TerraVision, a DEM tile included data representing the shape of the terrain.	*See* Undisputed Facts ¶ 64.
68. In TerraVision, OI tiles and DEM tiles were combined to render the three-dimensional terrain.	TerraVision Source Code, *e.g.*, at TerraVisionRender, ThreeDWidgetGenerateVisible (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 62-65; MAGIC Final Report, *e.g.*, at GOOG 358 & Fig. 4 ("This application, called TerraVision, combines elevation data, aerial photographs, models of buildings, and models of vehicles whose positions were obtained using GPS receivers, all stored in a remote terrain database accessed via a highspeed network.") (Chang Decl. Ex. 21); MAGIC IEEE Article, *e.g.,* at GOOG 349 ("The data used by TerraVision are derived from raw imagery and elevation information which have been preprocessed by a companion application known as TerraForm.") ("In order to render an image, TerraVision requires a digital description of the shape and appearance of the subject terrain.") ("Rendering of the terrain on the screen is accomplished by combining the DEM and ortho-image tiles for the selected area at the appropriate resolution.") (Chang Decl., Ex. 22).
69. OI tiles were provided to the renderer in TerraVision.	*See* Undisputed Facts ¶ 68.
70. DEM tiles were provided to the renderer in TerraVision.	*See* Undisputed Facts ¶ 68.
TerraVision had "*data blocks belonging to a hierarchical structure*"	
71. In TerraVision, the data blocks belonged to a hierarchical structure which includes blocks at a plurality of	TerraVision Source Code, *e.g.*, at ThreeDWidgetCalcVisibility (Chang Decl., Exs. 20, 34);

different resolution levels.	August 11, 2006 Rebuttal Expert Report of Dinesh Manocha, Ph.D., *e.g.*, at ¶ 34 ("I do not disagree that data blocks in the TerraVision system belong to a hierarchical structure.") (Chang Decl., Ex. 8); Feiner Decl. ¶¶ 66-68; Lau Depo at 67:9-70:9 (Chang Decl., Ex. 14); MAGIC Final Report, *e.g.*, at GOOG 359 ("A Pyramid is a multiresolution representation of a single image, be it an original (digitized) aerial image, a processed satellite image, or an image representing elevation data (also called a Digital Elevation Model, or DEM). Each Pyramid forms a resolution hierarchy, or pyramid, which is a series of images of increasingly lower spatial resolution. For example, most images in this project correspond to approximately 1 meter ground resolution (that is, each pixel in the image covers approximate 1 meter square on the ground). This first image, or Pyramid level, forms the base of the Pyramid. The next level in the series corresponds to 2 meter ground resolution, and requires half as many pixels in each direction. The next level is at 4 meters, and so on.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 349 ("These requirements are addressed by preparing a hierarchy of increasingly lower-resolution representations of the DEM and ortho-image tiles in which each level is at half the resolution of the previous level. The tiled, multiresolution hierarchy and the use of multiple resolutions to achieve perspective are shown in Fig. 3.") (Chang Ex. 22).
TerraVision practiced the step of "*receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level*"	
72. In TerraVision, tiles were referenced by an x-coordinate, a y-coordinate and a respective resolution level.	TerraVision Source Code, *e.g.* TsTileId (integers "x," "y" and "res" represented the "X coordinate of tile," the "Y coordinate of tile" and the "[r]esolution number of the tile"),

	QuadTile (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 65; Lau Depo at 72:1-21, 75:14-76:20, 219:20-220:6 (Chang Decl., Ex. 14); MAGIC Final Report, *e.g.*, at GOOG 359 ("TerraVision requests these tiles from the ISS by specifying the level and the (x,y) coordinate of the tiles that it needs.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 350 ("TerraVision includes two additional features: superposition of fixed and mobile objects on the terrain, and registration of the user's viewpoint to a map. Both of these features are made possible by precisely aligning the DEM and imagery data with a world coordinate system as well as with each other.") (Chang Decl., Ex. 22).
73. In the TerraVision source code, the function ThreeDWidgetGenerateVisible calls ThreeDWidgetCalcVisibility to generate a quadtree of visible tiles at up to the appropriate resolution based on the user's current view matrix.	TerraVision Source Code, *e.g.*, ThreeDWidgetGenerateVisible, ThreeDWidgetCalcVisibility (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 56, 65.
74. In the TerraVision source code, the quadtree of visible tiles at up to the appropriate resolution based on the user's current view matrix includes one or more coordinates in the terrain along with an indication of the respective resolution level.	TerraVision Source Code, *e.g.*, ThreeDWidgetGenerateVisible, TsTileId, QuadTile (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 65; Lau Depo at 72:1-21, 75:14-76:20, 219:20-220:6 (Chang Decl., Ex. 14).
75. In the TerraVision source code, the ParseQuadTree function receives the quadtree of visible tiles at up to the appropriate resolution based on the user's current view matrix from ThreeDWidgetGenerateVisible.	TerraVision Source Code, *e.g.*, ThreeDWidgetGenerateVisible, ParseQuadTree (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 55-56, 65.
76. In the TerraVision source code, the function	TerraVision Source Code, *e.g.*, ThreeDWidgetGenerateVisible (Chang Decl.,

ThreeDWidgetGenerateVisible is part of the "renderer" as construed by the Court.	Exs. 20, 34); Feiner Decl. ¶ 65.
77. In the TerraVision source code, the function ParseQuadTree is another object, and not part of the "renderer" as construed by the Court.	TerraVision Source Code, *e.g.*, ParseQuadTree (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 65.
78. In TerraVision, another object received from the renderer one or more coordinates in the terrain along with indication of a respective resolution level.	TerraVision Source Code, *e.g.*, TerraVisionRender, GenerateVisible, ThreeDWidgetGenerateVisible, ThreeDWidgetCalcVisibility, ThreeDWidgetCreateRenderPrimitive, ParseQuadTree (Chang Exs. 20, 34); Feiner Decl. ¶¶ 53, 55-56, 64-65, 69-72; MAGIC Final Report, *e.g.*, at GOOG 363-64 ("The first 'tile visibility' thread determines what tiles are visible and stores this set of tiles (after some preprocessing) in a triple-buffered display list in shared memory. Asynchronously, the second 'rendering' thread picks the next available display list and displays the tiles from that list.") ("The tile visibility thread is, in some sense, the heart of the TerraVision system. It uses a coarse-to-fine search strategy that allows it to find all the visible tiles at the appropriate resolution in very little time.") ("[T]he coarse-to-find search strategy works like this (see TerraVision: A Terrain Visualization System for technical details). First, the lowest-resolution tile (covering the entire site) is examined to see if it is visible from the given viewpoint. If so, the next step is to see if it is at the appropriate resolution. If so, the tile is used at that resolution and the procedure is complete. If not, the tile is marked as 'visible', and the four higher-resolution tiles (covering the same spatial extent as the single lower-resolution tile) are first checked to see if they are currently in memory. If not, the procedure is complete. If so, each tile is examined as the first one was. This procedure is applied

	recursively until no higher-resolution tiles need to be examined.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 350 ("A high-speed search algorithm is used to identify the tiles required to render a given view.") (Chang Decl., Ex. 22).
79. TerraVision was used on a computer with at least one processor.	TerraVision Source Code (Chang Decl., Exs. 20, 34); MAGIC Final Report, *e.g.*, at GOOG 362 ("TerraVision was designed to run on certain Silicon Graphics (SGI) workstations....") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 350 ("High frame rates are achieved by using a local very-high-speed rendering engine, an SGI Onyx....") (SRI exercised one of its options to purchase a four-processor SGI Onyx workstation as a development platform.... Sprint purchased a more powerful six processor Onyx to demonstrate TerraVision....") (Chang Decl., Ex. 22).
TerraVision practiced the step of "*providing the renderer with a first data block which includes data corresponding to the one or more coordinates from a local memory*"	
80. In the TerraVision source code, the function ParseQuadTree determines the "leaf" tiles that are resident in memory in the quadtree of visible tiles at up to the appropriate resolution based on the user's current view matrix.	TerraVision Source Code, *e.g.*, ParseQuadTree (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 55, 65, 74.
81. In the TerraVision source code, the function ParseQuadTree provides a list of the "leaf" tiles that are resident in memory to ThreeDWidgetGenerateVisible.	TerraVision Source Code, *e.g.*, ParseQuadTree, ThreeDWidgetGenerateVisible (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 55, 65, 74.
82. In TerraVision, another object provided to the renderer a first data block which includes data corresponding to the one or more coordinates, from a local memory.	TerraVision Source Code, *e.g.*, TerraVisionRender, GenerateVisible, ThreeDWidgetGenerateVisible, ThreeDWidgetCalcVisibility, ThreeDWidgetCreateRenderPrimitive,

	ParseQuadTree (Chang Exs. 20, 34); Feiner Decl. ¶¶ 53, 55-56, 64-65, 73-75; MAGIC Final Report, *e.g.*, at GOOG 364-65 ("Since the terrain database is much too large to be kept in main memory, TerraVision keeps a small fraction of the available tiles in a local cache. By using a local cache, TerraVision is able to display a new view at any time, no matter how quickly the user moves. The penalty that is paid is that if the user moves too quickly (or jumps to an entirely new location), the display may not be at the desired resolution.") ("The strategy we have adopted is to use the coarse-to-fine strategy outlined earlier. The tile visibility thread attempts to find the appropriate resolution tile by iteratively dividing tiles into four (it actually divides the space represented by the tile into four). When a tile must be subdivided it checks to see if the four higher-resolution tiles are in memory. If not, then that tile is used, even though it's at a lower resolution than required. Consequently, the user sees the highest-resolution representation possible at all times.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 351 ("[A]lthough the entire set of high-resolution tiles cannot be collocated with the application, it is certainly feasible to store a complete set of lower-resolution tiles. For example, if the entire data set comprises 1 Tbyte of high-resolution tiles, then all of the tiles that are five or more levels coarser would occupy less than 1.5 Mbyte, a readily affordable amount of local storage. If a tile with resolution at, say, level 3 is requested but not delivered in time for the image to be rendered, then, until the missing level-3 tile arrives, the locally available coarser tile from level 5 would be used in place of the 16 level-3 tiles. This substitution manifests itself by the affected portion of the rendered image appearing 'fuzzy' for a brief period of

	time.") (Chang Decl., Ex. 22).
83. TerraVision was used on a computer with a local memory.	TerraVision Source Code (Chang Decl., Exs. 20, 34); MAGIC Final Report, *e.g.*, at GOOG 362, 364 ("TerraVision was designed to run on certain Silicon Graphics (SGI) workstations….") ("Since the terrain database is much too large to be kept in main memory, TerraVision keeps a small fraction of the available tiles in a local cache. By using a local cache, TerraVision is able to display a new view at any time, no matter how quickly the user moves.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 350, 351 ("High frame rates are achieved by using a local very-high-speed rendering engine, an SGI Onyx….") ("[A]lthough the entire set of high-resolution tiles cannot be collocated with the application, it is certainly feasible to store a complete set of lower-resolution tiles. For example, if the entire data set comprises 1 Tbyte of high-resolution tiles, then all of the tiles that are five or more levels coarser would occupy less than 1.5 Mbyte, a readily affordable amount of local storage. If a tile with resolution at, say, level 3 is requested but not delivered in time for the image to be rendered, then, until the missing level-3 tile arrives, the locally available coarser tile from level 5 would be used in place of the 16 level-3 tiles.") (Chang Decl., Ex. 22).
TerraVision practiced the step of "*downloading from a remote server one or more additional data blocks at a resolution level higher than the resolution level of the first data block which include data corresponding to the one or more coordinates if the provided block from the local memory is not at the indicated resolution level*" and "*downloading blocks of lower resolution levels before blocks of higher resolution levels*"	
84. In TerraVision, OI tiles were downloaded from a remote server.	TerraVision Source Code, *e.g.*, TSMSpawnThreads, GenerateRequets, TsMakeRequests, GenerateAndSendRequests, ThreeDWidgetGenerateRequests, ThreeDWidgetCalcVisibility, tsmReqTile,

	tsmStopReqTiles, tsmGetNextTileHeader, tsmGetNextTileData, tsmStopReqTiles_iss, tsmGetNextTileHeader_iss, tsmGetNextTileData_iss, tsmGetTile_web, tsmGetNextTileData_web, tsmHttpUrlToBuffer, TsImageServerReader, TsReadTileFromTSM (Chang Exs. 20, 34); Feiner Decl. ¶¶ 53-60, 76-78; Manocha Depo at 74:25-75:6 (Chang Decl., Ex. 15); MAGIC Final Report, *e.g.*, at GOOG 364 ("Since the local cache is only a small fraction of the entire database, TerraVision must attempt to have all tiles required for the current viewpoint in memory for use by the visible tile and rendering threads.... Prefetching tiles, as this procedure is called, is carried out in two separate threads. There is a 'tile prediction' thread for predicting the user's movement and determining the set of tiles that will be visible in the predicted viewpoint, and a 'tile requesting' thread for requesting those tiles from the ISS (eliminating those that are already in memory).") ("As with the visible tile thread, the tile prediction thread uses a coarse-to-fine search strategy. Consequently, the coarsest tiles are placed in the request list first. This placement is important because it means that, on average, the coarsest tiles (covering the largest spatial extent) will be received first.") ("In addition, TerraVision uses a separate 'tile receiver' thread for receiving tiles from each ISS server.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 351 ("If a tile with resolution at, say, level 3 is requested but not delivered in time for the image to be rendered, then, until the missing level-3 tile arrives, the locally available coarser tile from level 5 would be used in place of the 16 level-3 tiles. This substitution manifests itself by the affected portion of the rendered image appearing 'fuzzy' for a brief period of

	time.") ("[O]ne of the original premises underlying the MAGIC project is that the data set and the application are not collocated.") ("TerraVision first produces a list of new tiles required for the scene. This list is sent to an ISS master, which performs a name translation, mapping the logical address of each tile (the tile identifier) to its physical address (server/disk/location on disk). The master then sends each server an ordered list of the tiles it must retrieve.") (Chang Decl., Ex. 22); TerraVision Video (Chang Decl., Ex. 24).
85. In TerraVision, DEM tiles were downloaded from a remote server.	*See* Undisputed Facts ¶ 84; TerraVision Source Code, *e.g.*, TerraVisionInitDataSet, TsRequestDems (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 53; Manocha Depo at 71:5-12 (Chang Decl., Ex. 15).
86. In TerraVision, one or more additional OI tiles were downloaded from a remote server if the provided block from the local memory was not at the indicated resolution level.	*See* Undisputed Facts ¶ 84. TerraVision Source Code, *e.g.*, GenerateAndSendRequests (Chang Decl., Exs. 20, 34) Feiner Decl. ¶ 77; Manocha Depo at 74:25-75:6 (Chang Decl., Ex. 15).
87. In TerraVision, the additional OI tiles downloaded from the remote server were at a resolution level higher than the resolution level of the provided block from the local memory.	*See* Undisputed Facts ¶ 84; TerraVision Source Code, *e.g.*, GenerateAndSendRequests (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 77.
88. In TerraVision, the additional OI tiles downloaded from the remote server included data corresponding to the one or more coordinates received from the renderer.	*See* Undisputed Facts ¶ 84; TerraVision Source Code, *e.g.*, GenerateAndSendRequests (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 77.

[redacted]	
89. TerraVision was used on a computer with a communication link.	TerraVision Source Code (Chang Decl., Exs. 20, 34); MAGIC Final Report, *e.g.*, at GOOG 358, 362 ("This application, called TerraVision, combines elevation data, aerial photographs, models of buildings, and models of vehicles whose positions were obtained using GPS receivers, all stored in a remote terrain database accessed via a highspeed network.") ("TerraVision was designed to run on certain Silicon Graphics (SGI) workstations….") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 347, 350 ("The objective of the MAGIC (which stands for Multidimensional Applications and Gigabit Internetwork Consortium") project was to build a testbed that could demonstrate real-time, interactive exchange of data at gigabit-per-second rates among multiple distributed resources. This objective was pursued through a multidisciplinary effort involving concurrent development and subsequent integration of three testbed components: An innovative terrain visualization application that requires massive amounts of remotely stored data; A distributed image server system with performance sufficient to support the terrain visualization application; A standards-based high-speed internetwork to link the computing resources required for real-time rendering of the terrain.") ("High frame rates are achieved by using a local very-high-speed rendering engine, an SGI Onyx….") (Chang Del., Ex. 22).
TerraVision practiced the step of "*downloading blocks of lower resolution levels before blocks of higher resolution levels*"	
90. In TerraVision, OI tiles were requested from a remote server in coarse-to-fine order.	TerraVision Source Code, *e.g.*, GenerateAndSendRequests , tsmReqTile, tsmStopReqTiles (Chang Decl., Exs. 20, 34); Feiner ¶¶ 57, 76-78. MAGIC Final Report, *e.g.*, at GOOG 364

	("As with the visible tile thread, the tile prediction thread uses a coarse-to-fine search strategy. Consequently, the coarsest tiles are placed in the request list first. This placement is important because it means that, on average, the coarsest tiles (covering the largest spatial extent) will be received first.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 351 ("If a tile with resolution at, say, level 3 is requested but not delivered in time for the image to be rendered, then, until the missing level-3 tile arrives, the locally available coarser tile from level 5 would be used in place of the 16 level-3 tiles. This substitution manifests itself by the affected portion of the rendered image appearing 'fuzzy' for a brief period of time.") ("[O]ne of the original premises underlying the MAGIC project is that the data set and the application are not collocated.") (Chang Decl., Ex. 22); TerraVision Video (Chang Decl., Ex. 24).
91. In TerraVision, OI tiles requested from the remote server were received in coarse-to-fine order when TerraVision used the http protocol.	*See* Undisputed Facts ¶ 90; TerraVision Source Code, *e.g.*, tsmGetTile_web, tsmGetNextTileData_web, tsmHttpUrlToBuffer (Chang Decl., Exs. 20, 34). Feiner Decl. ¶ 79.
92. In TerraVision, DEM tiles were requested from a remote server in coarse-to-fine order.	*See* Undisputed Facts ¶ 90; TerraVision Source Code, *e.g.*, TsRequestDems, TsRequestDEMLevel, tsmReqTile, tsmStopReqTiles (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 53, 61, 77-79.
93. In TerraVision, DEM tiles requested from the remote server were received in coarse-to-fine order when TerraVision used the http protocol.	*See* Undisputed Facts ¶ 90; TerraVision Source Code, *e.g.*, tsmGetTile_web, tsmGetNextTileData_web, tsmHttpUrlToBuffer (Chang Decl., Exs. 20, 34);

	Feiner Decl. ¶ 79.
TerraVision Anticipates the Claims 7, 8, 18 and 22 of the '189 Patent	
TerraVision practiced the step of downloading "excess blocks not currently needed by the renderer to fill up the local memory when not downloading blocks required by the renderer," as that step is interpreted by Skyline.	
94. In TerraVision, excess blocks not currently needed by the renderer were downloaded to fill up the local memory.	TerraVision Source Code, *e.g.*, at ThreeDWidgetGenerateRequests, ThreeDWidgetCalcVisibility, GenerateAndSendRequests (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 80-82; MAGIC Final Report, *e.g.*, at GOOG 364 ("Since the local cache is only a small fraction of the entire database, TerraVision must attempt to have all tiles required for the current viewpoint in memory for use by the visible tile and rendering threads.... Prefetching tiles, as this procedure is called, is carried out in two separate threads. There is a 'tile prediction' thread for predicting the user's movement and determining the set of tiles that will be visible in the predicted viewpoint, and a 'tile requesting' thread for requesting those tiles from the ISS (eliminating those that are already in memory).") (Chang Decl., Ex. 21); *Cf.* MAGIC IEEE Article, *e.g.*, at GOOG 351 ("TerraVision attempts to predict the path the user will follow, requesting tiles that *might* soon be needed, and assigning one of three levels of priority to each tile requested.") (""Priority-1 tiles are needed as soon as possible; the ISS retrieves and dispatches these first.... The priority-2 tiles are those that the ISS should retrieve but should transmit only if there are no priority-1 tiles to be transmitted; that is, priority-2 tiles are put on a lower-priority transmit queue in the I/O buffer of each ISS server.... Priority-3 tiles are those that should be retrieved and cached at the ISS server; these tiles are less likely to be needed

	by TerraVision.") (Chang Decl., Ex. 22); TerraVision Tech Note, *e.g.*, at GOOG 388 ("Given the inherent uncertainty in predicting a user's future viewpoint, it is necessary not only to pre-fetch those tiles within the predicted viewpoint, but also those in the surrounding area. This is accomplished by increasing the field of view as a function of ΔT.") ("Using an expanded field of view of the predicted viewpoint is a relatively simple mechanism that has the advantage that exactly the same code used for traversing the terrain quad tree for the current view can be used to create a truncated quad tree for the future view. The truncated quad tree is then traversed in a breadth-first fashion. For each node encountered, a test is made to see if the corresponding color tile is currently in memory (since the first few top levels are always in memory, the test is not necessary at these levels). If the tile is not currently in memory, the coordinates of the tile are placed at the bottom of the list of tiles to pre-fetch. This process is continued until either all the nodes have been examined, or the maximum allowed number of tiles per pre-fetch, N_p, is reached. If the former occurs, and if the database retrieval protocol has a secondary list of 'tiles to pre-fetch if there's time', the remaining tiles could be placed on this list.") (Chang Decl., Ex. 23).
95. In the TerraVision source code, ThreeDWidgetGenerateRequests generates a quadtree of requested tiles at up to the appropriate resolution, based on a "bloated" view matrix.	TerraVision Source Code, *e.g.*, at ThreeDWidgetGenerateRequests, ThreeDWidgetCalcVisibility (Chang Decl., Exs. 20, 34); Feiner Decl. ¶ 56.
96. In the TerraVision source code, the "bloated" view matrix is a view matrix specifying an expanded version of the view frustum used by the tile visibility thread.	*See* Undisputed Facts ¶ 95.
97. In the TerraVision source code, the	TerraVision Source Code, *e.g.*, at

"bloated" view matrix will include tiles required by the renderer and tiles not currently needed by the renderer.	ThreeDWidgetGenerateRequests, ThreeDWidgetCalcVisibility (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 56, 81.
98. In the TerraVision source code, GenerateAndSendRequests places both tiles required by the renderer and excess tiles not currently needed by the renderer on a download request list if they are not already in memory.	TerraVision Source Code, *e.g.*, at ThreeDWidgetGenerateRequests, ThreeDWidgetCalcVisibility, GenerateAndSendRequests (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 55-56, 81.
99. In the TerraVision source code, GenerateAndSendRequests does not assign any priority to downloading tiles required by the renderer before downloading excess tiles.	*See* Undisputed Facts ¶ 95.
TerraVision had a "connection to the Internet" and practiced the step of downloading the data blocks "via the Internet"	
100. In TerraVision, data blocks were downloaded from a remote server via the MAGIC Network.	TerraVision Source Code, *e.g.*, at tsmStopReqTiles_iss, tsmGetNextTileHeader_iss, tsmGetNextTileData_iss (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 58, 84-85. Lau Depo at 37:4-38:5, 38:10-22, 80:24-81:23, 82:10-83:11, 85:22-86:14, 86:19-87:5, 90:7-91:4, 108:16-110:10, 193:22-194:18, 272:2-273:12, 281:25–283:1; MAGIC Final Report, *e.g.*, at GOOG 358 (The Multidimensional Applications and Gigabit Internet Consortium (MAGIC) project was a collaborative effort involving many participants….") ("This application, called TerraVision, combines elevation data, aerial photographs, models of buildings, and models of vehicles whose positions were obtained using GPS receivers, all stored in a remote terrain database accessed via a highspeed network.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 347

	("The objective of the MAGIC (which stands for Multidimensional Applications and Gigabit Internetwork Consortium") project was to build a testbed that could demonstrate real-time, interactive exchange of data at gigabit-per-second rates among multiple distributed resources. This objective was pursued through a multidisciplinary effort involving concurrent development and subsequent integration of three testbed components: An innovative terrain visualization application that requires massive amounts of remotely stored data; A distributed image server system with performance sufficient to support the terrain visualization application; A standards-based high-speed internetwork to link the computing resources required for real-time rendering of the terrain.") (Chang Del., Ex. 22); Clinger, GraphicsNet '95, *e.g.*, at p. 14 (Chang Decl., Ex. 26); SIGGRAPH '95 Multimedia CD (Chang Decl., Ex. 25); SIGGRAPH '95 Visual Proceedings (Chang Decl., Ex. 30); Supercomputing '95 Brochure (Chang Ex. 31).
101. In TerraVision, data blocks were downloaded from a remote server via the Internet.	TerraVision Source Code, *e.g.*, at tsmGetTile_web, tsmHttpUrlToBuffer (Chang Decl., Exs. 20, 34); Feiner Decl. ¶¶ 59-60, 84-85; Lau Depo at 37:4-38:5, 38:10-22, 80:24-81:23, 82:10-83:11, 85:22-86:14, 86:19-87:5, 90:7-91:4, 108:16-110:10, 193:22-194:18, 272:2-273:12, 281:25–283:1; MAGIC Final Report, *e.g.*, at GOOG 364, 369 ("An interesting consequence of the coarse-to-fine request strategy is that TerraVision can also run over relatively slow networks. As the user moves around the terrain over a slow network, TerraVision continues to display at its normal rate. But because the network is slow,

	by the time a coarse tile has arrived, the user has moved to a new location, so a different coarse tile is requested. Consequently, as the user moves the terrain, he or she sees only a coarse-resolution view of the terrain. If the user stops, eventually all of the tiles are delivered and the user sees a high-resolution view of the scene.") ("SRI demonstrated TerraVision running over the Internet at the JPL, connected to ISSs in Menlo Park. Although this situation was not optimal, it demonstrated the ability of TerraVision and the ISS to adapt to network bandwidth capabilities.") (Chang Decl., Ex. 21); MAGIC IEEE Article, *e.g.*, at GOOG 356 ("Proper testing of TerraVision and the ISS required high-speed interconnectivity. However, SRI and LBNL, the respective developers of these components, did not have such connectivity.") (Chang Decl., Ex. 22); Clinger, GraphicsNet '95, *e.g.*, at p. 14 (Chang Decl., Ex. 26); SIGGRAPH '95 Multimedia CD (Chang Decl., Ex. 25); SIGGRAPH '95 Visual Proceedings (Chang Decl., Ex. 30); Supercomputing '95 Brochure (Chang Ex. 31).
102. The MAGIC Network had a connection to the Internet.	*See* Undisputed Facts ¶¶ 100-101.

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Respectfully submitted,

By: /s/ Darryl M. Woo

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Certificate of Service

I hereby certify that, on January 19, 2007, I caused a true and accurate copy of the foregoing document to be served upon all counsel of record for each party by complying with this Court's Administrative Procedures for Electronic Case Filing.

By: ____/s/ Darryl M. Woo______________
Darryl M. Woo